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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,577	06/16/2006	Ivo Vankelecom	50304/130001	8018

21559 7590 04/01/2009

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EXAMINER	
ZALASKY, KATHERINE M	

ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
04/01/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentadministrator@clarkelbing.com

Office Action Summary	Application No.	Applicant(s)	
	10/596,577	VANKELECOM ET AL.	
	Examiner	Art Unit	
	KATHERINE ZALASKY	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20071010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 15-28, as amended 2 August 2006, are currently pending. **Claims 1-14** are cancelled.

Claim Rejections - 35 USC § 102

1. **Claims 15-24 and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by Kulkarni et al. (US 6,508,860).

Regarding **claim 15**, Kulkarni et al. discloses a pressure-driven process for the separation of liquid feeds through a membrane (abstract, C1/L16-23), in which a separation membrane comprises an elastomer in which a filler is dispersed (C2/L35-43, C3/L28-37, C10/L42-46).

While Kulkarni et al. does not explicitly disclose that the filler/matrix interactions limit the swelling of the membrane, it is noted that once a membrane is disclosed to comprise an elastomeric material cross-linked with a filler material and therefore is the same as the membrane of **claim 15**, it will, inherently, display recited properties. See MPEP 2112.

Additionally, a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See In re Hirao, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding **claims 16-20, 23, 24 and 26**, Kulkarni et al. discloses all of the claim limitations as set forth above. Additionally, the reference discloses the process wherein:

- two or more components are separated over a membrane by means of a pressure gradient driven by a pressure generated at the feed site (C1/L16-23)
- the filler acts as a cross-linker for the elastomer (C10/L42-46)
- the filler is a molecular sieve or porous material with nanometer dimension windows, channels or cavity architectures (C4/L37-52)
- the filler is silica, alumina, titania or a carbon molecular sieve (C4/L65-C5/L2)
- the filler is a molecular sieve or porous material having pores with a median diameter in the range 0.3-10 nm (C4/L37-52, 0.3 nm, 0.4 nm, 0.5 nm)
- said filler is a zeolite (C4/L65-C5/L2)
- said filler is a zeolite having a ZSM-5 structure (C4/L65-C5/L2)
- said elastomer is a polysiloxane (C8/L45-56)

Regarding **claims 21 and 22**, Kulkarni et al. discloses all of the claim limitations as set forth above. While Kulkarni et al. does not explicitly disclose that the elastomeric membrane contains a filler that results in a swelling reduction of the elastomeric membrane of at least 3%, or that swelling reduction results in an increase of the rejection of the elastomeric membrane for solutes of at least 3%, it is noted that once a membrane is disclosed to comprise an elastomeric material cross-linked with a filler

material and therefore is the same as the membrane of **claims 21 and 22**, it will, inherently, display recited properties. See MPEP 2112.

2. **Claims 15-24, 26 and 27** are rejected under 35 U.S.C. 102(b) as being anticipated by Vankelecom et al. ("Influence of Zeolites in PDMS Membranes: Pervaporation of Water/Alcohol Mixtures").

Regarding **claim 15**, Vankelecom et al. discloses a pressure-driven process for the separation of liquid feeds through a membrane, in which disturbance of the pressure-driven separation is decreased or prevented by a separation membrane (pg 13195, C1/¶3) comprising an elastomer in which a filler is dispersed in such a way that the filler/matrix interactions limit swelling of the membrane (pg 13195, C1/¶3, elastomer is PDMS, filler is ZSM-5).

Regarding **claim 16**, Vankelecom et al. discloses all of the claim limitations as set forth above. While the reference does not explicitly disclose the process wherein two or more components are separated over a membrane by means of a pressure gradient driven by a pressure generated at the feed site, the reference does disclose that water-ethanol mixtures are separated by pervaporation (pg 13195, C1/¶3). Additionally, it is well known in the art that pervaporation processes inherently apply a pressure gradient across the membrane as a driving force (as evidenced by EPA, "What is pervaporation?").

Regarding **claims 17-20, 23, 24, 26 and 27**, Vankelecom et al. discloses all of the claim limitations as set forth above. Additionally, the reference discloses the process wherein:

- the filler acts as a cross-linker for the elastomer (pg 13195, C1/¶3)
- the filler is a molecular sieve or porous material with nanometer dimension windows, channels or cavity architectures (pg 13195, C1/¶3, filler is ZSM-5)
- the filler is silica, alumina, titania or a carbon molecular sieve (pg 13195, C1/¶3, filler is ZSM-5)
- the filler is a molecular sieve or porous material having pores with a median diameter in the range 0.3-10 nm (pg 13195, C1/¶3, filler is ZSM-5)
- said filler is a zeolite (pg 13195, C1/¶3, filler is ZSM-5)
- said filler is a zeolite having a ZSM-5 structure (pg 13195, C1/¶3, filler is ZSM-5)
- wherein said elastomer is a polysiloxane (pg 13195, C1/¶3, elastomer is PDMS)
- said elastomer is a polydimethylsiloxane (pg 13195, C1/¶3, elastomer is PDMS)

While the reference does not explicitly disclose that ZSM-5 has pores with a median diameter in the range of 0.3-10 nm, this property is inherently present (as evidenced by Vankelecom et al. "Parameters influencing zeolite incorporation in PDMS membranes", pg 12391, Table 1).

Regarding **claims 21 and 22**, Vankelecom et al. discloses all of the claim limitations as set forth above. While Vankelecom et al. does not explicitly disclose that the elastomeric membrane contains a filler that results in a swelling reduction of the

elastomeric membrane of at least 3%, or that swelling reduction results in an increase of the rejection of the elastomeric membrane for solutes of at least 3%, it is noted that once a membrane is disclosed to comprise an elastomeric material cross-linked with a filler material and therefore is the same as the membrane of **claims 21 and 22**, it will, inherently, display recited properties. See MPEP 2112.

3. **Claims 15-24, 26 and 27** are rejected under 35 U.S.C. 102(b) as being anticipated by Vankelecom et al. ("Parameters influencing zeolite incorporation in PDMS membranes").

Regarding **claim 15**, Vankelecom et al. discloses a pressure-driven process for the separation of liquid feeds through a membrane, in which disturbance of the pressure-driven separation is decreased or prevented by a separation membrane (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2) comprising an elastomer in which a filler is dispersed in such a way that the filler/matrix interactions limit swelling of the membrane (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, elastomer is PDMS, filler is ZSM-5 or silicate)

Regarding **claim 16**, Vankelecom et al. discloses all of the claim limitations as set forth above. While the reference does not explicitly disclose the process wherein two or more components are separated over a membrane by means of a pressure gradient driven by a pressure generated at the feed site, the reference does disclose that water-ethanol mixtures are separated by pervaporation (pg 12395, C1/¶1-2). Additionally, it is well known in the art that pervaporation processes inherently apply a pressure gradient across the membrane as a driving force (as evidenced by EPA, "What is pervaporation?").

Regarding **claims 17-20, 23, 24, 26 and 27**, Vankelecom et al. discloses all of the claim limitations as set forth above. Additionally, the reference discloses the process wherein:

- the filler acts as a cross-linker for the elastomer (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2)
- the filler is a molecular sieve or porous material with nanometer dimension windows, channels or cavity architectures (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, filler is ZSM-5 or silicate, pg 12391, Table 1)
- the filler is silica, alumina, titania or a carbon molecular sieve (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, filler is ZSM-5 or silicate, pg 12391, Table 1)
- the filler is a molecular sieve or porous material having pores with a median diameter in the range 0.3-10 nm (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, filler is ZSM-5 or silicate, pg 12391, Table 1)
- said filler is a zeolite (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, filler is ZSM-5 or silicate)
- said filler is a zeolite having a ZSM-5 structure (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, filler is ZSM-5)
- wherein said elastomer is a polysiloxane (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, elastomer is PDMS)
- said elastomer is a polydimethylsiloxane (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, elastomer is PDMS)

Regarding **claims 21 and 22**, Vankelecom et al. discloses all of the claim limitations as set forth above. While Vankelecom et al. does not explicitly disclose that the elastomeric membrane contains a filler that results in a swelling reduction of the elastomeric membrane of at least 3%, or that swelling reduction results in an increase of the rejection of the elastomeric membrane for solutes of at least 3%, it is noted that once a membrane is disclosed to comprise an elastomeric material cross-linked with a filler material and therefore is the same as the membrane of **claims 21 and 22**, it will, inherently, display recited properties. See MPEP 2112.

Claim Rejections - 35 USC § 103

4. **Claims 25, 27 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kulkarni et al. (US 6,508,860), as applied to **claim 15** above.

Regarding **claim 25**, Kulkarni et al. discloses all of the claim limitations as set forth above. While the reference does not explicitly disclose the process wherein said filler is a zeolite having a USY structure, the reference does disclose that the filler may be a NaY or CaY zeolite which may be modified by treatment with $(NH_4)_2SiF_6$ in order to increase the Si/Al ratio (C4/L65-C5/L19). The reference further discloses that the details of the treatment are provided in Breck et al., US 4,503,023. Breck et al. discloses that an NaY zeolite having a starting SiO_2/Al_2O_3 ratio of 4.85 may be modified through the treatment to have an SiO_2/Al_2O_3 ratio of 9.54 and a unit cell of 24.51Å (see Example 1, C20/L62-C21/L39), which would be classified as an ultrastabilized Y zeolite (as evidenced by Cooper et al., US 5,601,798, C4/L64-67, C5/L14-16). Therefore, it

would be obvious to one having ordinary skill in the art to use the modified Y zeolite of Kulkarni et al., made according to the method of Breck et al., to obtain a USY zeolite.

Regarding **claims 27 and 28**, Kulkarni et al. discloses all of the claim limitations as set forth above. While the reference does disclose the process wherein said elastomer is nonporous, selectively gas permeable (C7/L27-45) and may be a polysiloxane (C8/L45-56), Kulkarni et al. does not disclose that the elastomer is a polydimethylsiloxane or that the elastomer is EPDM. However, polysiloxane, polydimethylsiloxane and EPDM are all known equivalents for nonporous, selectively gas permeable polymers for membrane formation (as evidenced by Livingston, WO 02/076588, pg 8/¶4). Therefore, it would be obvious to replace the polysiloxane in Kulkarni et al. with EDPM or polydimethylsiloxane as it is merely the selection of functionally equivalent polymers recognized in the art and one of ordinary skill in the art would have a reasonable expectation of success in doing so.

5. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vankelecom et al. ("Influence of zeolites in PDMS membranes: Pervaporation of water/alcohol mixtures"), as applied to **claim 15** above.

Regarding **claim 28**, Vankelecom et al. discloses all of the claim limitations as set forth above. While the reference does disclose the process wherein said elastomer may be a polydimethylsiloxane (pg 13195, C1/¶3, elastomer is PDMS), Vankelecom et al. does not disclose that the elastomer is EPDM. However, polydimethylsiloxane and EPDM are known equivalents for nonporous, selectively gas permeable polymers for membrane formation (as evidenced by Livingston, WO 02/076588, pg 8/¶4). Therefore,

it would be obvious to replace the polydimethylsiloxane in Vankelecom et al. with EDPM as it is merely the selection of functionally equivalent polymers recognized in the art and one of ordinary skill in the art would have a reasonable expectation of success in doing so.

6. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vankelecom et al. ("Parameters influencing zeolite incorporation in PDMS membranes"), as applied to **claim 15** above.

Regarding **claim 28**, Vankelecom et al. discloses all of the claim limitations as set forth above. While the reference does disclose the process wherein said elastomer may be a polydimethylsiloxane (pg 12390, C2/¶2-4, pg 12395, C1/¶1-2, elastomer is PDMS), Vankelecom et al. does not disclose that the elastomer is EPDM. However, polydimethylsiloxane and EPDM are known equivalents for nonporous, selectively gas permeable polymers for membrane formation (as evidenced by Livingston, WO 02/076588, pg 8/¶4). Therefore, it would be obvious to replace the polydimethylsiloxane in Vankelecom et al. with EDPM as it is merely the selection of functionally equivalent polymers recognized in the art and one of ordinary skill in the art would have a reasonable expectation of success in doing so.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KATHERINE ZALASKY whose telephone number is (571) 270-7064. The examiner can normally be reached on Monday-Thursday, 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KZ/
24 March 2009

/Krishnan S Menon/
Primary Examiner, Art Unit 1797